

CLAIMS:

1. An ultrasonic transmitting and receiving apparatus comprising:
 - an ultrasonic transducer array including a plurality 5 of ultrasonic transducers arranged in a matrix form;
 - waveform information setting means for setting waveform information to be used for transmitting a plurality of ultrasonic beams, each of which is synthesized by a plurality of ultrasonic signals having amplitude and phase
- 10 characteristics represented by Bessel function, within a predetermined period; and
 - drive signal generating means for generating a plurality of drive signals for respectively driving said plurality of ultrasonic transducers included in said ultrasonic transducer array on the basis of the waveform information set by said waveform information setting means.
2. The ultrasonic transmitting receiving apparatus according to claim 1, wherein said waveform information setting means sets said waveform information so that said 20 plurality of ultrasonic beams are transmitted from different areas included in said ultrasonic transducer array, respectively.
3. The ultrasonic transmitting receiving apparatus according to claim 1, wherein said waveform information 25 setting means sets said waveform information so that said plurality of ultrasonic beams are transmitted from the same area included in said ultrasonic transducer array.

4. The ultrasonic transmitting receiving apparatus according to claim 1, further comprising:

delay time setting means for setting delay time of the ultrasonic signals in said drive signal generating means so 5 that said plurality of ultrasonic beams are steered; and image generating means for generating an ultrasonic image on the basis of detection signals obtained by receiving ultrasonic echoes.

5. The ultrasonic transmitting receiving apparatus 10 according to claim 2, further comprising:

delay time setting means for setting delay time of the ultrasonic signals in said drive signal generating means so that said plurality of ultrasonic beams are steered; and image generating means for generating an ultrasonic 15 image on the basis of detection signals obtained by receiving ultrasonic echoes.

6. The ultrasonic transmitting receiving apparatus according to claim 3, further comprising:

delay time setting means for setting delay time of the 20 ultrasonic signals in said drive signal generating means so that said plurality of ultrasonic beams are steered; and image generating means for generating an ultrasonic image on the basis of detection signals obtained by receiving ultrasonic echoes.

25 7. The ultrasonic transmitting receiving apparatus according to claim 1, further comprising:

control means for controlling at least one of a position

of said ultrasonic transducer array and an orientation of an aperture thereof; and

image generating means for generating an ultrasonic image on the basis of detection signals obtained by receiving
5 ultrasonic echoes.

8. The ultrasonic transmitting receiving apparatus according to claim 2, further comprising:

control means for controlling at least one of a position of said ultrasonic transducer array and an orientation of
10 an aperture thereof; and

image generating means for generating an ultrasonic image on the basis of detection signals obtained by receiving ultrasonic echoes.

9. The ultrasonic transmitting receiving apparatus according to claim 3, further comprising:

control means for controlling at least one of a position of said ultrasonic transducer array and an orientation of an aperture thereof; and

image generating means for generating an ultrasonic
20 image on the basis of detection signals obtained by receiving ultrasonic echoes.